

**REMARKS**

Entry of the foregoing, reexamination and reconsideration of the application identified in caption, as amended, pursuant to and consistent with 37 C.F.R. §1.111 and in light of the remarks which follow, are respectfully requested.

By the above amendments, claims 39 and 50-57 have been canceled without prejudice or disclaimer. As a result, claims 9-38 and 40-49 are currently pending in the present application.

Claim 9 has been amended for clarification purposes to recite that the at least one ligand has a formula selected from the group consisting of formulas (A) to (S). Claim 24 has been amended for clarification purposes to recite that the at least one ligand has a formula selected from the group consisting of and formulas (A) to (L), (O), (P) and (S). Support for these amendments can be found in the specification at least at pages 9-21.

It is noted that formula (K) which is recited in amended claims 9 and 24 corresponds to chemical formula (11) set forth at page 14 of the specification. Applicants submit that the specification contains typographical errors in chemical formula (11) in that the " $-C_2N_4-$ " groups recited therein should be  $-C_2H_4-$  groups. Claims 9 and 24 have been amended to correct such typographical errors. It is submitted that in light of the fact that the recitation of  $-C_2N_4-$  groups is obviously in error, and that the specification describes various other exemplary ligands which employ  $-C_2H_4-$  groups, one of ordinary skill in the art would have recognized that Applicants were in possession of such chemical formula (11) containing the proper  $-C_2H_4-$  groups.

Claim 40 has been amended for clarification purposes by replacing "M" with "the at least one metal species," by deleting " $[(MoOS)_2]^{2+}$ ", " $[Mo_2S_4]^{2+}$ " and " $(MoO)^{2+}$ " therefrom, and to depend from claim 9. Claim 41 has been amended for clarification purposes by deleting the phrase "dissolved in an aqueous solvent comprising a compound as in claim 39," and to depend

from claim 10. Claim 47 has been amended for clarification purposes by replacing "M" with "the at least one metal species," by deleting the phrase "B is independently selected from condensed phosphate and polyoxycarboxylic acid," and to depend from claim 9. Claim 48 has been amended for clarification purposes by replacing "B" with "the at least one condensed phosphate." Claim 49 has been amended for clarification purposes by replacing "A" with "the at least one ligand."

In the Official Action, claims 39-53 stand rejected under 35 U.S.C. §112, first paragraph, for the reasons set forth at page 2 of the Official Action. In particular, the Patent Office has taken the position that claims 39 and 50 are not fully supported by the originally filed application. Without addressing the propriety of this rejection, and in an effort to expedite prosecution, claims 39 and 50 have been canceled by the above amendments. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 9-57 stand rejected under 35 U.S.C. §112, second paragraph, for the reasons set forth at pages 2 and 3 of the Official Action. Specifically, the Official Action states that "[i]t is unclear as to what is the intended chemical structure and formula of the said compound because . . . the poly dentate chelate ligand has not been described." Without addressing the propriety of this rejection, and to expedite prosecution, each of claims 9 and 24 has been amended to recite a list of specific ligands. Accordingly, the chemical structure of the recited ligands is not unclear.

The Patent Office has alleged that claims 9 and 24 are indefinite for reciting the "open-ended phrase 'comprising.'" However, it is standard U.S. claims drafting practice to recite the term "comprising" in a claim, and the recitation of such term does not itself render the claims indefinite.

The rejection of claims 39, 50, 51 and 53-57 is moot in light of the cancellation of such claims. The rejection of claim 40 has been obviated by the deletion of the term "(MoO)<sup>+</sup>." The rejection of claim 41 has been obviated by amending claim 41 to depend from claim 10, which is directed to an aqueous lubricant.

In view of the foregoing, it is clear that the claims fully comply with the provisions set forth in the second paragraph of 35 U.S.C. §112. Accordingly, withdrawal of this rejection is respectfully requested.

Claims 9-57 stand rejected under 35 U.S.C. §103(a) as being obvious over Japanese Patent Document No. 7-118283 (*JP '283*) combined with U.S. Patent No. 4,151,099 (*Nassry et al*) in view of U.S. Patent No. 3,249,538 (*Freier et al*), U.S. Patent No. 4,654,155 (*Kipp et al*), Japanese Patent Document No. 4-239096 (*JP '096*) and "Tribology in Metalworking" (*Schey*). Withdrawal of this rejection is respectfully requested for at least the following reasons.

According to one aspect of the present invention as defined by claim 9, a multi-ligand metal chelate compound is provided comprising: at least one metal species selected from the group consisting of zinc, manganese, iron, molybdenum, tin and antimony, the metal species having multiple coordinating sites; at least one polydentate chelate ligand having sulfur as a coordinating atom, the at least one ligand coordinating to at least one of the multiple coordination sites of the at least one metal species and having a formula selected from the group consisting of the formulas (A) to (S); and at least one condensed phosphate and/or polyoxycarboxylic acid coordinated to the remaining coordination sites.

According to another aspect of the present invention as defined by claim 24, a compound is provided comprising: at least one multi-valent metal ion selected from the group consisting of zinc, manganese, iron, molybdenum, tin and antimony; at least one polydentate chelate ligand

having at least two sulfur atoms as coordinating atoms, the at least two sulfur coordinating atoms being bound to the at least one metal ion, the at least one ligand having a formula selected from the group consisting of the following formulas (A) to (L), (O), (P) and (S); and at least two other groups bound to the at least one metal ion, the groups selected from condensed phosphate and polyoxycarboxylic acid.

*JP '283* relates to a process for producing a metal dithioxanthate which comprises reacting a dithioxanthate with a molybdate or tungstate in the presence of a mineral acid (see abstract).

*JP '283* does not disclose or suggest each feature of aspects of the present invention defined by claims 9 and 24. For example, *JP '283* does not disclose or suggest a polydentate chelate ligand having a formula selected from the group consisting of the formulas (A) to (S) recited in claim 9, or the formulas (A) to (L), (O), (P) and (S) recited in claim 24.

By comparison, *JP '283* discloses a metal dithioxanthate represented by the general formula  $((\text{ROCS}_2)_2\text{M}^2\text{O})_2\text{O}$  (*JP '283* at page 2). Clearly, the  $((\text{ROCS}_2)_2\text{M}^2\text{O})_2\text{O}$  compound of *JP '283* is not the same as or suggestive of the formula (A) to (S) compounds recited in claim 9, or the formula (A) to (L), (O), (P) and (S) compounds recited in claim 24. Moreover, absent an improper resort to Applicants' own disclosure, one of ordinary skill in the art would not have been motivated to substitute the  $((\text{ROCS}_2)_2\text{M}^2\text{O})_2\text{O}$  compound with one of the ligands recited in claims 9 or 24.

The secondary applied documents fail to cure the above-described deficiency of *JP '283*. In this regard, the Patent Office has relied on *Nassry et al* for disclosing "a water-based composition for metalworking comprising Mo or Sb compounds" (Official Action at page 4). As well, the Patent Office has asserted that "the treating of a metal surface with phosphate and organic acid compounds and the insitu reaction of phosphate with iron and zinc reaction of

phosphate with iron and zinc ions producing crystalline coatings would be obvious in view of the teachings of Freier, Kipp, Yasuro [sic] and Schey" (Official Action at page 5). However, without addressing the propriety of combining the six documents applied in the present §103(a) rejection, it is noted that like *JP '283*, each of the secondary applied documents fails to disclose or suggest a ligand having a formula selected from the group consisting of the formulas (A) to (S) recited in claim 9, or the formulas (A) to (L), (O), (P) and (S) recited in claim 24.

For at least the reasons discussed above, it is apparent that no *prima facie* case of obviousness exists. Accordingly, withdrawal of the §103(a) rejection is respectfully requested.

From the foregoing, further and favorable action in the form of a Notice of Allowance is believed to be next in order, and such action is earnestly solicited. If there are any questions concerning this paper or the application in general, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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